

## **Claims**

What is claimed is:

- 1    1.    A forelimb brace device for protecting the fingers, hand, wrist, and forearm  
2    of a user from impact injuries, comprising:  
3        a proximal support shell;  
4        a distal support shell;  
5        an MCP joint subassembly that interconnects said proximal support shell  
6    and said distal support shell to permit pivotal movement between said proximal  
7    support shell and said distal support shell;  
8        an adjustable forearm anchoring mechanism integrated in combination with  
9    said proximal support shell and adjustable in tension to secure said forelimb  
10   brace device against the forearm of the user;  
11        an adjustable wrist anchoring mechanism integrated in combination with  
12   said proximal support shell and adjustable in tension to secure said forelimb  
13   brace device against the wrist of the user; and  
14        an adjustable palmar-grip anchoring mechanism integrated in combination  
15   with said proximal support shell, said adjustable palmar-grip anchoring  
16   mechanism including a palmar grip for positioning the fingers and hand of the  
17   user, said adjustable palmar-grip anchoring mechanism being adjustable in  
18   tension to secure the hand and wrist in said forelimb brace device;  
19        wherein interactive cooperation among said MCP joint subassembly, said  
20   adjustable forearm anchor mechanism, said adjustable wrist anchoring  
21   mechanism, and said adjustable palmar-grip anchoring mechanism immobilizes  
22   the wrist of the user in a predetermined flexion position.
- 1    2.    The forelimb brace device of claim 1 further comprising:  
2        an inner support layer integrated in combination with the inner surface of  
3    said distal support shell.

1     3,     The forelimb brace device as in claim 1 or 2 further comprising:  
2             an inner support layer integrated in combination with the inner surface of  
3     said proximal support shell.

1     4.     The forelimb brace device of claim 1 further comprising  
2             a finger retention strap integrated in combination with said distal support  
3     shell.

1     5.     The forelimb brace device of claim 1 wherein said adjustable palmar-grip  
2     mechanism comprises:  
3             a strap means integrated in combination with said palmar grip; and  
4             a ratchet assembly affixed to the dorsal surface of said proximal support  
5     shell in a specified orientation with respect to the centerline thereof and  
6     integrated in combination with said strap means for movement therebetween;  
7             wherein said ratchet assembly is operative to cause movement of said strap  
8     means wherein tension is applied to said strap means and said palmar grip in  
9     combination therewith.

1     6.     The forelimb brace device of claim 5 wherein said strap means is integrated  
2     in combination with said proximal support shell by means of a retaining ring; and  
3     wherein the specified orientation of said affixed ratchet assembly is diagonal with  
4     respect to the centerline of said proximal support shell.

1     7.     The forelimb brace device of claim 5 wherein the specified orientation of  
2     said affixed ratchet assembly is along the centerline of said proximal support  
3     shell.

1     8.     The forelimb brace device of claim 1 wherein said MCP joint subassembly  
2     further comprises:  
3             a proximal stop structure associated with said proximal support shell; and  
4             a distal stop structure associated with said distal support shell;

5        wherein abutting engagement between said proximal stop structure and  
6        said distal stop structure limits the pivotal movement between said proximal  
7        support shell and said distal support shell.

1        9.    The forelimb brace device of claim 1 wherein said adjustable forearm  
2        anchoring mechanism comprises:  
3               a retaining ring affixed to one lateral surface of said proximal support shell;  
4               and  
5               a Velcro strap having one end thereof affixed to the other lateral surface of  
6        said proximal support surface;  
7               wherein said Velcro strap is integrated in combination with said retaining  
8        ring such that the other end thereof can be manipulated by the user to apply  
9        tension to said Velcro strap to secure said forelimb brace device against the  
10       forearm of the user.

1        10.    The forelimb brace device of claim 1 wherein said adjustable forearm  
2        anchoring mechanism comprises:  
3               a buckle integrated in combination with one lateral surface of said proximal  
4        support shell; and  
5               a belt means affixed to the other lateral surface of said proximal support  
6        shell;  
7               wherein said belt means and said buckle are integrated in combination by  
8        the user to apply tension to said belt means to secure said forelimb brace device  
9        against the forearm of the user.

1        11.    The forelimb brace device of claim 1 wherein said adjustable forearm  
2        anchoring mechanism comprises:  
3               a ratchet buckle integrated in combination with one lateral surface of said  
4        proximal support shell; and

5           a strap means having one end thereof affixed to the other lateral surface of  
6 said proximal support means and the other end thereof integrated in combination  
7 with said ratchet buckle;  
8           wherein said ratchet buckle is operative to cause movement of said strap  
9 means wherein tension is applied to said strap means to secure said forelimb  
10 brace device against the forearm of the user.

1   12. The forelimb brace device of claim 1 wherein said adjustable wrist  
2 anchoring mechanism comprises:  
3           a retaining ring affixed to one lateral surface of said proximal support shell;  
4 and  
5           a Velcro strap having one end thereof affixed to the other lateral surface of  
6 said proximal support surface;  
7           wherein said Velcro strap is integrated in combination with said retaining  
8 ring such that the other end thereof can be manipulated by the user to apply  
9 tension to said Velcro strap to secure said forelimb brace device against the wrist  
10 of the user.

1   13. The forelimb brace device of claim 1 wherein said adjustable wrist  
2 anchoring mechanism comprises:  
3           a buckle integrated in combination with one lateral surface of said proximal  
4 support shell; and  
5           a belt means affixed to the other lateral surface of said proximal support  
6 shell;  
7           wherein said belt means and said buckle are integrated in combination by  
8 the user to apply tension to said belt means to secure said forelimb brace device  
9 against the wrist of the user.

1   14. The forelimb brace device of claim 1 wherein said adjustable wrist  
2 anchoring mechanism comprises:

3       a ratchet buckle integrated in combination with one lateral surface of said  
4 proximal support shell; and  
5       a strap means having one end thereof affixed to the other lateral surface of  
6 said proximal support means and the other end thereof integrated in combination  
7 with said ratchet buckle;  
8       wherein said ratchet buckle is operative to cause movement of said strap  
9 means wherein tension is applied to said strap means to secure said forelimb  
10 brace device against the wrist of the user.

1   15. The forelimb brace device of claim 1 wherein said MCP joint subassembly  
2 for interconnecting said proximal support shell and said distal support shell  
3 comprises:  
4       spaced-apart proximal joint housings associated with said proximal support  
5 shell;  
6       spaced-apart distal joint housings associated with said distal support shell,  
7 said spaced-apart distal joint housings corresponding in number and opposed  
8 relation to said spaced-apart proximal joint housings; and  
9       a resilient member integrated in combination with opposed ones of said  
10 spaced-apart proximal and distal joint housings;  
11       wherein said resilient members facilitate pivotal movement between said  
12 proximal support shell and said distal support shell.